

AMENDMENT

In the Claims

1. (Currently Amended) A wireless telephone handset comprising:
an antenna connection;
a diplexer coupled to the antenna connection;
a transmit section connected to a first port of the diplexer;
a receive section connected to a second port of the diplexer; and
wherein the diplexer includes first and second notch filters, each of the notch filters comprising a main transmission line, a first coupling mechanism, and a first electrically tunable resonator coupled to the main transmission line through the first coupling mechanism, wherein the first electrically tunable resonator includes a voltage tunable dielectric varactor incorporating ~~tunable dielectric material that a composite or doped voltage tunable dielectric material fabricated without heating to a temperature just below the eutectic temperature. capable of a permittivity in a range from about 20 to about 2000, and a tunability in a range from about 10% to about 80% at temperatures including room temperature.~~

2. (Represented and currently amended) A wireless telephone handset according to claim 1, wherein said composite or doped voltage tunable dielectric material are selected from the group consisting of: BSTO-MgO, BSTO-MgAl₂O₄, BSTO-CaTiO₃, BSTO-MgTiO₃, BSTO-MgSrZrTiO₆, and combinations thereof.

3. (Currently Amended) A wireless telephone handset according to claim 1 2, wherein said composite or doped voltage tunable dielectric material is a BSTO-composite ceramic material. ~~the first tunable varactor comprises:~~
~~a substrate having a first dielectric constant and having a generally planar surface;~~
~~a tunable dielectric layer positioned on the generally planar surface of the substrate,~~
~~the tunable dielectric layer having a second dielectric constant greater than said first dielectric constant; and~~

~~first and second electrodes positioned on a surface of the tunable dielectric layer opposite the generally planar surface of the substrate, said first and second electrodes being separated to form a gap therebetween.~~

4. (Original) A wireless telephone handset according to claim 1, wherein the first coupling mechanism comprises one of:

a first capacitive probe, a first inductive loop, a first iris window, a first evanescent waveguide piece, a first slot, and a first hole.

5. (Original) A wireless telephone handset according to claim 1, wherein the main transmission line comprises one of:

a coaxial transmission line, a microstrip line, a stripline line, a rectangular waveguide, a coplanar waveguide, and a ridged waveguide.

6. (Original) A wireless telephone handset according to claim 1, wherein each of the first and second notch filters further includes:

a second coupling mechanism; and

a second electrically tunable resonator coupled to the main transmission line through the second coupling mechanism, wherein the first and second coupling mechanisms are spaced $\frac{1}{4}$ wavelength apart at an operating frequency of the filter.

7. (Currently Amended) A wireless telephone handset comprising:

an antenna connection;

a diplexer coupled to the antenna connection;

a transmit section connected to a first port of the diplexer;

a receive section connected to a second port of the diplexer; and

wherein the diplexer includes first and second notch filters, each of the notch filters comprising a bandpass filter connected between a termination and one of a circulator or a 3dB hybrid, wherein the bandpass filter includes a voltage tunable dielectric varactor incorporating ~~tunable dielectric material~~ a composite or doped voltage tunable dielectric material fabricated without heating to a temperature

~~just below the eutectic temperature, capable of a permittivity in a range from about 20 to about 2000,
and a tunability in a range from about 10% to about 80% at temperatures including room temperature.~~